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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,697	05/01/2001	Paul M. Ferm	COR-SP01-107	2899

7590

05/03/2005

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EXAMINER

MCPHERSON, JOHN A

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/846,697

Applicant(s)

FERM ET AL.

Examiner

John A. McPherson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10, 13, 14 and 18-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13, 14 and 18-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/24/05 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 13, 15, 16 and 18-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,306,563 to Xu et al. (Xu) in view of the article "Resists in Microlithography" by O'Brien et al. (O'Brien). Xu discloses a process of forming a waveguide comprising the steps of applying a lower cladding polymerizable composition to a substrate; at least partially curing the lower cladding polymerizable material; applying a core polymerizable composition to the lower cladding; imagewise exposing the core polymerizable composition through a photomask to at least partially cure the exposed image portion; developing to remove the nonimage areas of the core

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polymerizable composition; applying an upper cladding polymerizable composition to the core; and at least partially curing the upper cladding composition, wherein after application of the upper cladding polymerizable composition any unpolymerized or non fully polymerized portions of the upper cladding, lower cladding or core layer is subjected to a hard curing by overall exposure. See column 7, line 56 to column 10, line 21. Additionally, Xu discloses removing oxygen from the polymerizable compositions by purging with nitrogen or evacuating (see column 29, lines 10-21 and column 32, line 59 to column 33, line 38), providing a buffer layer on the substrate (see column 12, lines 34-41), and performing the masked exposure by conventional proximity techniques (see column 24, lines 18-39). Furthermore, Xu discloses that after full polymerization the refractive index of the core is higher than the refractive index of the cladding, and the buffer layer must have a refractive index lower than that of the core. However, Xu does not teach the percentage difference between the refractive index of the buffer and the core or the cladding and the core, nor does Xu teach the distance between the photomask and the core layer during deoxygenation and proximity exposure.

O'Brien discusses exposure techniques for microlithography, and with respect to proximity printing teaches that a gap of 10-30 micrometers is preserved, so as to avoid the problem of particulate contamination. See the last paragraph on page 327.

It would have been obvious to one skilled in the requisite art to arrive at the percentage difference between the refractive index of the buffer and the core or the cladding and the core of the presently claimed invention, since it has been held that

where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges or values of a result effective variable involves only routine skill in the art. *In re Aller*, 105 USPQ 233 and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Note Xu discloses it is important that after full polymerization the refractive index of the core is higher than the refractive index of the cladding, and the buffer layer must have a refractive index lower than that of the core, and teaches ranges for the refractive indices. According, these are result effective variables.

It would have been obvious to one skilled in the requisite art to preserve a gap of 10-20 micrometers, as taught by O'Brien, in the conventional proximity exposure technique of Xu because it is taught that this is within the range of the gap conventionally employed in proximity printing, and proximity printing avoids the problems of particle contamination and mask damage. Furthermore, it would have been obvious to one skilled in the requisite art to keep the mask away from the surface of the core layer during deoxygenation of the core layer because it is known in the art that the presence of a mask in close proximity to the layer during deoxygenation would interfere with the removal of oxygen from the polymerizable compositions by purging with nitrogen or evacuating as taught by Xu.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1-10, 13, 15, 16 and 18-33 have been considered but are moot in view of the new ground(s) of rejection.

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4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. McPherson whose telephone number is (571) 272-1386. The examiner can normally be reached on Monday through Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John A. McPherson  
Primary Examiner  
Art Unit 1756

JAM  
4/30/05